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EDITORIAL.

In accordance with a time honoured custom, we heartily tender to all our readers in this, the opening number of a new volume, the compliments of the season—a happy and a prosperous new year. It is meet at these annually recurring points in the history of our journal that we should briefly review the past, believing as we do that a recalling to mind the advances we have made and the encouraging success which has attended our efforts thus far will stimulate us to renewed exertion and make us hopeful and trustful for the future. Five years ago the CANADIAN ENTOMOLOGIST made its first appearance as a small eight paged magazine. Our members were scarcely sanguine enough to hope for a regular monthly issue even of this size, so in the opening number its appearance was promised occasionally, as material should accumulate; but our success has been beyond our expectations, the issue of our journal has been tolerably regular up to the present time; we have gradually increased its size from eight to twenty pages; have risen from common white paper to finely finished toned paper, have embellished our pages with many beautiful wood-cuts, and have presented to our readers from time to time Entomological matter in such variety as we trust will have met the views and wishes of all those who have favored us with their patronage. The work which our late esteemed Editor has so successfully carried on we shall, with his assistance and that of our other coadjutors, endeavour to continue.

To those who have aided us by their valuable contributions to our pages we are especially grateful, and we sincerely hope for a continuance of these esteemed favors. Pressed as we are with a burden of other work, we trust our friends will continue to forward their papers without waiting for personal solicitation. We propose to continue the monthly articles on our common insects, and also to furnish such gleanings in our

summary as we think will interest the general reader, while at the same time we shall endeavour to maintain for our journal that scientific standing which gives it value in the eyes of so many of our co-laborers in the Entomological field.

We feel persuaded that our readers will not overlook the fact that this festive season is the time also for renewing their subscriptions; money is a motive power in our operations which we cannot overlook. This gentle hint will no doubt be heartily responded to, and we trust that while our members bear in mind their own liabilities in this matter, they will also try to induce as many of their friends as possible to join our ranks, so that the circulation of the ENTOMOLOGIST may be greatly increased.

ON SOME OF OUR COMMON INSECTS.

II. THE TIGER SWALLOW TAIL—*Papilio turnus*, Linn.

BY THE EDITOR.

All our readers must have seen the large tiger swallow tail butterfly floating about in the warm days of July and August, enjoying the

Fig. 1.



sunshine and sipping the honey from flowers. It is among our largest and handsomest butterflies. In figure 1 we have an excellent represen-

tation of it. When its wings are expanded this insect will measure about four inches across. The ground color of its wings is a pale lemon yellow, which is banded and bordered with black; on the fore wings are four black bars, the inner one extending entirely across the wing, the outer ones shortening more and more as they approach the apex. The front margin is edged with black, and the outer margin has a wide border of the same in which is set a row of eight or nine pale yellow spots, the lower ones less distinct.

The hind wings are crossed by a streak of black which is almost a continuation of the inner band on the fore wings; there is a short black streak a little beyond at the end of the discal cell, and a wide black border widening as it approaches the inner angle of the wing. Enclosed within this border and towards its outer edge are six lunular spots, the upper and lower ones reddish, the others yellow; above and about these spots and especially towards the inner angle of the wing, the black bordering is thickly powdered with blue scales. The outer margin of the hind wings is scalloped and partly edged with yellow; the inner margin is bordered with dusky for about two-thirds of its length, followed by a small yellow patch, which in turn is succeeded by a larger black spot centered with a crescent of blue atoms and bounded below by an irregular reddish spot margined within with yellow. The hind wings terminate in two long black tails, edged on the inside with yellow. The body is black above, margined with pale yellowish; below yellowish streaked with black.

The under surface of the wings somewhat resembles the upper, but is paler.

This species passes the winter in the chrysalis state, and appears first on the wing from the middle to the latter end of May, but becomes much more plentiful during July. Whether these July insects are a second brood, or whether the bulk of the chrysalids which have wintered do not mature until about this time we are unable to determine; individuals which we have wintered over have escaped from chrysalis as late as the 3rd of June.

The eggs of *turnus* are deposited singly on the leaves of the different plants or trees on which the larva feeds. They are between one-twentieth and one-twenty-fifth of an inch in diameter, sub-globular, flattened at the place of attachment; colour dark green, surface smooth, without reticulations, but showing a few small irregularly distributed spots under

a magnifying power of forty-five diameters. In about ten or twelve days they begin to change colour, becoming darker, and very dark just before the young larvæ are hatched.

When fresh from the egg the larva is about one-tenth of an inch long, with a large black head and with a black body roughened with small brownish black tubercles. The second segment is elevated or thickened and of a dull glossy flesh colour, with a prominent fleshy tubercle on each side and a patch of white on the seventh and eighth segments, wide anteriorly, pointed behind; there is also a dull flesh coloured streak along the back on fourth and eleventh segments. The twelfth segment has a pair of fleshy tubercles rather prominent, but not so large as those on the second; both those on the second and twelfth have several short whitish hairs arising from them. The under surface is brownish black, with the feet and prolegs of the same colour.

The full grown larva, see figure 2, taken July 14th, measured one and a half inches in length. Its head is rather large and of a reddish brown

Fig. 2.



colour, sprinkled with very short white hairs.

The body above, green, of a slightly darker shade on the anterior segments, paler on the sides of the body, over which there is a whitish bloom produced by a multitude of very minute white dots, with small short hairs of the same colour issuing from them; the anterior segments of the body are wrinkled. On the front edge of the second segment is a raised yellow fold slightly overhanging the head, and on each side of the fourth segment is an eye-like spot, nearly oval in shape, yellow, encircled with a ring of black, centered with a small elongated blue dot, which is also set in black and has above it on each side a black line nearly crossing the yellow spot. On the hinder portion of the fifth segment is a raised yellow fold, bordered behind with rich velvety black, the latter visible only when the larva is in motion; on the terminal segment is a similar fold flattened above, with a slight protuberance on each side. On the fifth segment, in front of the yellow fold, are two blue dots, one on each side of the dorsal line; there are also faint traces on the hinder segments of a continuation of these dots in longitudinal rows.

The under surface is of a paler green than the upper, with a whitish bloom; prolegs of the same colour, feet tipped with brown.

As the larva approaches maturity and is about to change to a chrysalis, the colour of the body gradually grows darker until it becomes dark reddish brown, the sides nearly black. The minute whitish granulations and the blue dots become much more distinctly visible, giving the larva a very different appearance. It then selects some suitable spot in which to pass the chrysalis state, where it spins a web of silk in which its hind feet are entangled, and having prepared and stretched across a silken band to sustain its body in the middle, it casts its larva skin and remains a dull brownish chrysalis until the following spring.

This insect is widely distributed, being found throughout the greater portion of the United States and Canada. The larva feeds on a number of different trees, but chiefly affects with us the apple, cherry, thorn and basswood.

THE USE OF APHIS-EXCRETION AND BENEFIT DERIVED THEREFROM.

BY THOMAS G. GENTRY, GERMANTOWN, PA.

It is well known to the popular as well as scientific world that the *Aphides* secrete or rather excrete a peculiarly viscid and honey-like fluid which forms one of the chief delicacies of Ants. That it was originally designed to form an article of food for the latter is a supposition that cannot be entertained for a single moment; but that it is in some way connected with the preservation of the soft and tender beings by which it is manufactured, there can be no reasonable doubt. Various opinions have been hazarded, and not a few theories devised to account for its probable origin and use and the material benefit which it secures to the authors thereof, but these have been of such an unsatisfactory character as not to merit the approval of the learned.

While some writers have surmised its application to be connected in some way with the wants of the newly-born *Aphis*, still the lack of evidence confirmatory of any such surmise has caused it to fall into neglect and disuse.

That this fluid has both a primary and a secondary purpose to subserve in the economy of the plant louse is a fact the truth of which stands off as gross as black from white. Recently, while engaged in the study of the

Aphis which particularly infests the blossoms of *Cucurbita ovifera*, I had the happy satisfaction of being a witness of a phenomenon which promised to solve the knotty problem. After a few moments of calm and deliberate reflection upon what I observed, the entire theory, the details of which I am about to delineate, became almost intuitively outlined upon my mind.

Feeding upon the flowers of this plant were hundreds of lice, the groupings of which not even a careless and hasty observer could fail to detect. There, like the patriarchal tribes we read about, were observable group after group, each composed of a head and a family of children of diverse ages and sizes. In the arrangement the young and newly-born, as if requiring the first care and earliest attention of the mother, were closely in her rear, the proximity to her presence in the case of the residue being apparently determined by their age.

While intently scrutinizing the actions of the various groups, one little fellow was observed to caress its parent by means of its antennæ, as if soliciting the bestowal of a favor. After the lapse of some few seconds the mother, acting in obedience to the child's wishes as thus expressed, slowly elevated the posterior part of her abdomen and ejected a honey drop upon the head of the latter, apparently to its infinite delight and satisfaction. It is my honest opinion, evidenced by repeated observations, that it is only during the first two days of the life of the offspring that this process of feeding is necessary, the digestive organs at this period being too feeble and delicate to partake of the strong juice of the flower without the entailment of injury. But after undergoing remarkable changes in the alimentary laboratory it becomes deprived of its injurious properties and rendered fit for the sustenance of life.

In conjunction with the previous discovery I remarked that the older and stronger seldom, if ever, deviated from the path over which their maternal head had passed, but seemed to find their chief good attained by following closely therein. It seems just to conclude that this would not be if they were amply qualified to look after their own temporal welfare; but on the ground that parental provision and attention are still indispensable, the reason is obvious.

Plant lice being vigorous feeders, the manufacture and excretion of this fluid would necessarily be very great and profuse, and as nature does not work in vain, it might be argued that it is a sort of compensation which the insect lavishes upon the plant for the losses which it

momentarily sustains. But to this opinion I cannot assent, as experience teaches me that the plant does not receive the least benefit therefrom. Even if it possessed any healing virtues, these could not manifest any marked effects, owing to the very rapid multiplication of the lice, which are constantly probing the wounds by means of their puctorial apparatus and thus serving to heighten instead of lightening the evil. Viewing the subject in this light, nature would seem to be defeating her own ends.

It is true that these highly mischievous creatures are slightly held in check by a few species of the Ichneumonidæ, Syrphidæ and Coccinellidæ, but their rate of increase is so enormously out of proportion to the number of their enemies that very little good results to plants.

From the preceding remarks it is evident to the mind of every candid reasoner that plants receive no material advantage from this excretion. It now remains to indicate its use. That it is of great service to the newly born *Aphis*, totally unfitted as it is both by nature and by structure to imbibe the strong, yet sometimes acrid and bitter fluids of plants, there can be no doubt. But as the supply is clearly above the requirements of such, why the excess? Most assuredly to serve as *pabulum* for their stronger companions. How? By uniting with the plant's forced excretion, thus diluting and rendering it a suitable material for imbibition and digestion. That its primary use is to serve as food for the lice during their early existence I think from the argument adduced must be obvious to all.

That a secondary purpose also is subserved thereby, to wit, the preservation of the species, there are just grounds for belief. It is well known to naturalists that ants do not merely possess a fondness for sugar, gums and saccharine solutions, but that they also manifest a decided penchant for the rich juices and tender tissues of animals; the liquids and solids of humbler forms of insect life being sought after and devoured with avidity, save when the animals possess some peculiar properties that recommend them to the mercy of their enemies.

There is no doubt that the soft and juicy *Aphis*, which is esteemed such a rich morsel of food by the *Coccinella*, was primitively as delicious to the *Formica*, and that it shared equally with other feeble creatures of its class the murderous assaults of the latter. This condition of things doubtless continued for ages, until there appeared on the scene an ant possessed of more sagacity than any of its fellows.

This ant having discovered the hidden virtues of the *Aphis* excretion there would dawn a new era in the history of the two species. The news of this discovery would doubtless become diffused not only through the colony of which this ant formed a part, but through the entire species and kindred species, for the *Formicidae*, as is well known, exhibit in a remarkable manner the power of communicating their thoughts, wishes, &c., to each other.

As ants are endowed with a high degree of intelligence, considering the place which they occupy in the scale of created existence, they would not be slow to perceive that their chief good would be best attained by taking under protection the little creatures which are the authors of this luxury. From this time the ants would gradually abandon their sanguinary propensities, and little by little manifest their solicitude and regard for the latter by gentle strokes and caresses. The lice in turn perceiving the latter's disposition to friendliness, would cease by degrees to regard them as enemies, and would learn to cater to their physical wants. Thus would be developed these amicable relations which are known to exist between them, and which so admirably tend to their mutual good.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Page 232, vol. v.

BUTALIS.

B. fuscicomella, Clem.

B. flavifrontella, Clem.

Both of these species occur abundantly in this locality; but the latter (my specimens can be nothing else) has the apical vein furcate before the apex, whilst Dr. Clemens says that it is simple. Mr. Stainton says it may be *B. basilaris*, Zeller.

B. matutella? Clem.

I am not altogether certain that my specimens belong to this species which I know only by Dr. Clemens's description. The neurulation of the wings in my specimens is the same with that of Dr. Clemens's species as

given by him ; but there are some structural points in which it differs from *Butalis*, and Dr. Clemens' specific description is applicable to only a small proportion of individuals out of the many that I have examined. My specimens have been bred from larvae found mining the leaves of the great hog weed (*Ambrosia trifida*) and various species of Aster (*A. ericoides* and *A. sagittifolius*). It spins a small web on the under side of the leaf from which it passes into the leaf, eating out the parenchyma in small patches. It makes several mines before passing into the pupa state. The mine is at first convoluted, narrow and filled with frass, but soon becomes a clear transparent blotch somewhat like the mine of *Bedellia somnulentella* in leaves of the morning glory (*Ipomea*). It pupates in a dense web which it spins around itself, and which is but slightly attached to the surface of the leaf.

In the imago state the tongue is scaled at the base only, the wings are carried slightly deflexed in repose instead of being folded around the body as in the true species of *Butalis*. The primaries have only three instead of four veins beneath the apical one, and the head is rather less obtuse and is scarcely at all retracted. I had at first inclined to erect for it a new genus, and specimens in my cabinet were labelled *Sinoe ambrosiacella*, and have been distributed to some correspondents under that name. The neururation of the wings is very similar to that of the genus *Aybia*, but the palpi are very different.

The imago is shining bronzy dark brown, with a purplish tinge. Usually there is a whitish yellow spot on the fold of variable size, sometimes spreading to the dorsal margin, sometimes scarcely discernible, and sometimes absent : there is always a distinct streak of the same hue at the beginning of the dorsal cilia, and a white patch on the abdomen beneath near the apex. *Al. ex.* $\frac{1}{2}$ inch.

The larva is at first white with green contents ; then a small black spot appears on each side of the first segment, and afterwards a series or line of similar spots extends along the entire length of the larva and ultimately they become purple. In the later larval stages a purple line appears on each side of the median one. There is a small blackish spot behind each eye. In the adult larva the 9th and 10th segments become purple on top and the purplish longitudinal lines above mentioned are connected on the posterior margin of each segment by a transverse band of the same hue. It has sixteen feet, the thoracic ones being piceous. It may be found in all of its stages from June until the fall of the leaves.

ARGYRESTHIA.

A. oreasella. Clem.

Mr. Stainton states in his edition of the Clemens papers that this is the European *A. andereggiella*. It is the only species of the genus heretofore described from this country. I have never met with it in this locality but have received from Mr. Wm. Saunders several specimens with the information that they were all taken whilst resting on the leaves of a thorn bush (*Crataegus* — ?). In my specimens there is nothing that can be called an 'eye cap' only a few long scales pendant over the eyes from the elongate basal point of the antennæ, and the body, wings and antennæ more slender than in the species described below as *A. undulatella*. The neurulation of the wings in *oreasella* is exactly that given by Mr. Stainton (*Ins. Brit. Lep. Tin.*, v. 3) for *A. nitidella*.

A. undulatella. N. sp.

Not having recognized this as a true *Argyresthia* formerly, it was labelled in my cabinet *Chalciope undulatella*, and has been distributed to some correspondents under that name, and also under the names *Polyxo undulatella* and *Albunea undulatella*.

It is more robust than *oreasella*, the primaries are wider, the tuft on the vertex is larger, the basal joint of the antennæ is enlarged and has a distinct eye cap; the antennæ are much more robust and each joint is clothed with rather spreading scales so that it is enlarged towards its apex, the succeeding joint being inserted in the centre of its apex.

The neurulation of the primaries is like that of *oreasella*, but in the secondaries the discal vein is absent from the subcostal to the first branch of the discal, so that the cell is partly unclosed.

I have named the species *undulatella* from its habit of 'see-sawing' on its middle legs before it comes to rest in the attitude of the other species of the genus, resting on its head with the apex of the body and wings projecting at an obtuse angle to the object on which it rests. It is very sluggish and not easily disturbed. It is found in considerable numbers in May resting on the trunks of Elm trees. The larva is unknown.

A. undulatella. N. sp.

Palpi brownish, at base white; face white around the mouth, brownish above. Tuft and eye caps snowy white. Antennæ checkered with alternate black and white spots. Thorax and dorsal half of the primaries

snowy white; costal and apical portions brownish or dark brown, sometimes dusted with white and sometimes (usually) with streaks of the white extending into the brown portions, sometimes so as to divide it into two or three brownish costal streaks. There is great variety in the shade and proportions of the whitish and brownish portions of the wing, but snow white is the characteristic color of the basal and dorsal parts and brownish of the costal and apical parts, with the line between them more or less emarginate. *Al. ex.* $\frac{1}{3}$ inch. Kentucky.

A. apici-maculella. *N. sp.*

In this species the eye cap is as distinct as in *undulatella*, but the stalk is simple and slender as in *oreasella*. The neurulation of the primaries is that given by Mr. Stainton for *A. arceuthina* (*loc. cit.*) In the secondaries it is the inferior portion of the discal vein that is absent instead of the superior, as in *undulatella*; that is the portion next to the median vein.

Shining silvery white, each joint of the antennae (except the basal one) is dotted above with dark brown. Primaries with a blackish or dark brown shining almost triangular spot at the apex, with three pale and indistinct brownish costal streaks before it; the first of these streaks is the shortest and most indistinct, and is placed at the beginning of the ciliae. The second is a little more distinct and sometimes extends entirely across the wing, and the third one always does so after dividing into two branches just before the apical spot. These streaks are usually more or less interrupted and sometimes spread over the apex so that it might perhaps be more correctly described as dusted than streaked. There is a bright though pale golden basal streak just within the costal margin. *Al. ex.* $\frac{3}{8}$ inch. Kentucky, in oak woods, in June and July.

THE FAMILIES OF DIPTERA.

BY FRANCIS WALKER, LONDON, ENGLAND.

The two-winged flies are more important in nature than any other order of insects because of their number and diffusion, and the families may be briefly traced in succession previous to a more extended notice of each of them, in case the subject should become more interesting.

Family 1, PULICIDÆ.

" 2, MYCETOPHILIDÆ.

In the following arrangement the first manifestation of Dipterous existence is associated with the inmost recesses of man's habitation, and a few beasts and birds also partake of its presence in their dwellings. In this form it has some perfections in which it exceeds all the rest of the race, being unequalled in strength and in activity and in endurance of pressure. The dismissal of this wingless fly will be readily accepted, and there is a wide gap between it and the next form of Dipterous life wherein it is transferred to the fungoid-race, and here its work is to appropriate and elaborate the substance of the fungus and to raise it to its own level, and this will be said to be just contrary to the first scene in which it reduces the circulation of the vertebrata to its own purposes. In the second scene the fly has in some cases much resemblance in the body and in the legs to the first family, but the strength and the activity are comparatively passed away, and the structure of the mouth is much changed and much less effective; however, it has a compensation in the possession of wings. Even in the small extent of England there is yet much to learn about the fungus-flies, but there is a much wider field for observation in Canada and in the more northern regions of America where the gradual diminution and cessation of the race may be traced. Winnerty has contributed much more than any one else to the history of this family, and his synopsis of the sub-families is here translated:

A—Middle transverse vein elongated.

a—Brachial vein wanting.....1 Diadocidinae

b—Brachial vein present:

*—Antennæ not very long.

†—Brachial vein long.....2 Mycetobinae

††—Brachial vein short.....3 Ceroplatinae

* *—Antennæ very long.

†—Antennæ setiform.....4 Bolitophilinae

††—Antennæ filiform.....5 Macrocerinae

B—Middle transverse vein not elongated.

a—Brachial vein present.....6 Sciophilinae

b—Brachial vein wanting.....7 Mycetophilinae

NOTES ON NOCTUIDÆ.

BY AUG. R. GROTE,

*Curator of Articulata, Buffalo Soc. of Natural Sciences.**Agrotis badinodis*, Grote.

♂. Antennæ pectinate. All the tibiæ armed or spinose. Abdomen a little flattened. Body slender; wings ample and wide. Nearest to *Agrotis collaris*, but with wider wings, and larger and differently colored. Smooth, pale brown. Transverse lines even, with coincident pale shades. Basal half-line evident; on the sub-basal space a pale dot followed by darker scales situate on median nervure. Transverse anterior line straight, touching the broader superior portion of the large orbicular on subcostal nervure, and leaving on the disc an intensely blackish brown space to obtain between the narrower lower portion of the orbicular and the line. Reniform, like the orbicular, concolorous, with narrow pale edging, hardly as large as the orbicular and broader below than above. Space between the spots deep, faintly reddish brown, deepening to median nervure. The diffuse median shade apparent below median nervure. Claviform large, concolorous, indistinctly limited. Transverse posterior line even, regularly arcuate, much as in *collaris*. Subterminal space dark reddish brown; subterminal line faint, narrow, irregular, pale; terminal space paler, less reddish brown than the subterminal. Terminal line broken into minute dots; fringes dark.

Hind wings concolorous, dark silky fuscous, with pale fringes. Beneath with a reddish brown tinge; a common diffuse fuscous line, and a dark discal spot on the hind wings which are palest and notably irrorate. Collar dark, thorax pale brown; abdomen like hind wings. *Expanse*, 35 m. m. *Habitat*, Maryland (coll. Lintner, No. 2506.)

The antennal pectinations are longer than in *triangulum*, the color different, the orbicular differently shaped.

Eurois occulta.

I have determined this species in the collection of Mr. Lintner, from New York, and in that of the Laval University, Quebec. It is a robust form, resembling *Mamestra nimbosa* in appearance, but structurally distinguished by the naked eyes, spinose fore tibiæ and excavated genital

pieces. It should be considered as the type of Hubner's genus *Eurois*, a name which has priority over *Aplecta*, and is cast for the same species, most of which, as Lederer has shown, are not properly separable from *Mamestra*. *Polyphaenis* seems to me equally valid with *Eurois*; I am not therefore agreed with v. Heineman's fusion of the species of the two genera under the name of *Aplecta*. The late Mr. Walsh has already referred to this species as found in this country. The list of species common to both continents, given in the Proc. Ent. Soc. Phil., vol. 3, p. 214, contains, however, several errors of different kinds, and is therefore unreliable.

Luperina reniformis, Grote.

♂ ♀. Eyes naked, without lashes. Tibiæ all unarmed. Maxillæ weaker than in *Hadena*. Abdomen conical, apparently without tufts in the ♀, with longer dorsal depressed scales in the ♂, in either sex not with the thick squamation of *Hadena*. A little larger than *Hydr. sera*, which it resembles, but is more blackish, and the reniform is contrastedly annulate with white scales which usually extend along veins 3 and 4 at base, as in *Haworthi*. Beneath the thoracic squamation is somewhat woolly. Blackish brown; subterminal space usually contrasting by its pale ochreous color. Median space wide. Orbicular an oblique finely and faintly pale ringed annulet, concolorous with the wing. Claviform indistinct, black. Reniform very narrow, its base visible between veins 3 and 4, neatly ringed with pure white, preceded by a pale vertical streak which appears to cover the closure of the cell, but which is probably part of the true outer annulus of the spot. Median shade black, irregular, faint. T. p. line accentuated on the nervules, even, pale between double lines, not retreated on cell 2, followed by black nervular dots on the subterminal space. Subterminal line preceded by a dark brown shade which shows some more determinate shade marks, produced opposite the median nervure. Terminal space black, narrow. Interspaceal terminal black dots. The narrow brown fringes cut with pale at extremity of the veins. Hind wings pale fuscous with soiled veins, beneath with distinct dot and faint transverse line. Varies by the darkening of the subterminal space, and obsolescence of the pale scales on the median nervules. Antennæ simple in both sexes. *Expanse* 36 m. m. *Habitat* Canada; New York (Mead, No. 120; Lintner, No. 3588 and No. 3741 var.) Collection of Buffalo Society N. Sciences.

Hadena fractilinea, Grote.

♀. Eyes naked, with lashes. Thorax with anterior and posterior crests; the dorsal abdominal tufts are minute. Legs unarmed. Size moderate; squamation smooth. Dull blackish and very pale dull carneau brown. The pale color obtains along the internal margin of the fore wings and largely subterminally, extending to the apices without the undulate ferruginous subterminal line. The blackish color obtains at base and superiorly along costal region, and surmounting the pale subterminal space and over the constricted terminal space. The contrast between the two tints is variably strong, the blackish color becomes in some specimens dull brownish and the pale tint obscure and dusky. The median space is blackish above submedian fold, narrowed inferiorly; the ordinary spots small, orbicular concolorous with a fine pale annulation, reniform with the centre of the paler shade of the wing, with a dark internal streak. Transverse posterior line incompletely geminate, followed by a series of minute black and pale nervular dots. The twice prominently undulated subterminal is preceded by a more or less obvious ferruginous shade. Fringes black, narrowly cut with pale at the extremity of the veins. Hind wings concolorous brownish grey, rather dark, without lines; fringes pale with a narrow dark internal line. Beneath paler, dusted with dark scales, with a purplish or carneau tinge and a tolerably distinct exterior common line, more denticulately waved on secondaries. Patagia mixed with blackish scales; disc and tufts paler, touched with ferruginous; abdomen like hind wings. *Expanse*, 28 to 30 m. m. *Habitat*, Canada (Pettit, No. 1594); Albany (Lintner, Nos. 3568 and 1998). Much smaller and distantly recalling *rurea* in the disposition of the colors. It has apparently also a resemblance to the European *Agrotis putris*, but is generically distinct, and differs by the dark opaque secondaries.

Hadena cariosa.*Xylophasia cariosa*, Guenee, p. 144.

The median lines are more distinct than in its immediate allies. The median space is narrowed inferiorly, the large claviform extends to the transverse posterior line.

Cerastis alternata.*Noctua alternata*, Grote, Proc. Ent. Soc. Phil., Vol. III.

Eastern States; New York; Pennsylvania.

Cerastis cupida.

Noctua cupida, Grote, Proc. Ent. Soc. Phil., Vol. III.

Eastern States; New York; Pennsylvania.

Tesilla cinereola.

This species is the *Placodes cinereola* of Guenee, but the generic name had been previously used, and Herrich-Schaffer in consequence proposed the present designation for the European *amethystina*, and which should be retained for our species. Lederer's term *Eucarta* is later and has been withdrawn, in favor of *Tesilla*, by its author. Hubner enumerates the European species under *Trigonophora*, the type of which is quite distinct structurally from *Tesilla amethystina*.

Plusia gamma, (Linn).

Habitat, California (Hy. Edwards, No. 147).

I cannot distinguish the American specimens specifically. This species has been credited to Canada by Kirby (p. 307), and also to Hudson's Bay by Mr. Walker, in the British Museum Lists.

Adipsophanes miscellus, Grote.

Habitat, California (Hy. Edwards, No. 187).

ENTOMOLOGICAL READINGS,

Suggestive and Reflective.

BY W. V. ANDREWS, NEW YORK.

"There are no satisfactory distinctions between some of the moths which enable any one to say that they are of such and such species, and very frequently they are separated into different kinds because they happen to feed on various plants, and because the moths are not all colored in the same manner. Of course the Entomologists that believe in the real nature of species have taken a vast deal of trouble with the Noctuid, but those who do not think a species to be anything more than an abstract idea, and that it really consists of the sum of the variations of a closely allied series of forms, do not see the use of this Natural History hair splitting."—*Duncan's Transf. of Insects*, p. 125.

"Many naturalists have observed that the species of *Solenobia*, one of the Tineidæ, have a most exceptional power of reproduction. The maiden females of the genus lay eggs which can be hatched so as to produce larvæ, and a naturalist may breed a species for years without seeing a male *Solenobia*. This extraordinary fact is not without parallel amongst the Lepidoptera * * * and it is common among the bees and the aphides."—*Duncan's Transf. of Insects*, p. 146.

NOTE.—To many persons there will be, I hope, nothing new in the above statement, but there are more to whom it will not only be new but also incredible. In this connection I wish to state an occurrence, which, although not quite conclusive in its character, may, if known, recall to others similar occurrences with the same species, and they may have met with more definite results.

Two years ago, wishing to rear several broods of *Eacles imperialis*, I placed a female of that species in a favorable situation for attracting the male. I had forgotten whether the male usually remained in the company of the female for a long or a short time, and watched pretty closely till 1 o'clock a. m., for the purpose of ascertaining that fact.

I was much chagrined to find that at none of my visits was there any male visible. I was up betwixt 3 and 4 o'clock, a. m., still no male; and at broad daylight the result was the same. The female had, however, laid on the branches of the tree on which she was confined about thirty eggs, and although I considered them worthless, I put them into a small box without quite knowing why. I removed the female the next night to a still more promising spot, hoping that the eggs remaining in her might still be impregnated. No trace however of a male was visible, but, by the next morning, she had laid a quantity of eggs which I secured as before.

Every one of these eggs were fertile; but now comes the curious part of the matter. Every one of the larvae were of the dark brown variety, not a green one amongst them.

Now what I would like to learn is this: Does any one know of any case in which *imperialis* has produced fertile eggs without male assistance and, if so, what color were the larvæ?

CORRESPONDENCE.

SAN FRANCISCO, CAL., NOV., 1873.

DEAR SIR,—

Many printed pages you devote to the question of nomenclature and rights of priority of generic and specific names. Allow me a small space in your columns to say a word in no way personal, still from a different point of view, yet with deference to the contending opinions.

In the first place I would claim a general acknowledgement for such compilers of entomological material as have in an exhaustive way at their time—so far as exhaustion is possible—published the results of their researches, and which compilations form entireties of certain large groups of insects. I will refer to only a few, among them Burmeister, for his Rhynchosa and Gymnognatha; Gyllenhal, for his North European Coleoptera; Harold and Gemminger's Munich Catalogue of the World's Coleoptera; also, Ochsenheimer and Freitschke's work on Lepidoptera of Europe, this latter one so complete with Geometridæ and Micros.

All these compilers have worked with the full understanding of the value of generic names come down to them from earlier authorities, have been guided by the wish of letting Linne's and other great author's earliest names stand for the typical genus, giving room at the same time where, by newer discoveries, new genera had necessarily been created, for their interpolation. The great completeness of these published compilations, based upon conscientious researches, is what has created, if not all over the world, at least in Europe, the use and endearment of certain generic names that in my opinion might be everywhere respected, and will, I hope, everywhere and for ever be adopted. I see no necessity of going further back than the authority of such great compilers, even if a few errors of judgment, as likely, have occurred.

To restrict my observations to Lepidoptera only, I will here especially refer to Ochsenheimer and Freitschke's work of wonderful completeness; it treats of European Lepidoptera only. The European Fauna has its representatives all the world over, and it is around and between European genera that the world's new species have to be ranged, whether or not the formation of new genera becomes necessary. Such ground work or basis for a complete series of classes and genera as O. & F. have compiled might, in my opinion, be followed up and their generic names without omission be adhered to. Addressing American Entomologists, I would

allow myself the question: Might not all controversy about generic names, whether from earlier or later editions of Linne's or from other early authorities, be dropped, and all punctilious adherence to priority be dismissed; might not the long-familiar names on the strength of above named second-hand authorities be with safety fixed upon as final and generally acknowledged?

Yours respectfully,

JAMES BEHRENS.

P. S.—It would be well if the authors of new created generic names would give their Greek or Latin derivations.

HABITAT, ECONOMY, ETC., OF *AGROTIS FENNICA*, EVERSMAN.

SPRING BANK, ST. CATHARINES, ONT., DEC. 22, 1873.

DEAR SIR,—

I am very anxious to obtain information respecting *Agrotis fennica*, Eversman, whether it is an abundant species in any part of Canada or the United States, and, being a stranger in this country, would be very thankful would any gentleman conversant with the insect, kindly aid me in the pages of the CAN. ENT., by any information he may possess touching its economy in the larval state, food plant, time of year when the imago is found, or any other necessary details.

Finally, should any Entomologist have duplicate specimens to spare, I need scarcely say they will be very acceptable, and later on in the season I will do my best in return to repay the obligation, and send an equivalent in any desirable species from this neighborhood.

I have read with much interest the articles on collecting in late numbers of the CAN. ENT., especially as my experience with cyanide of potassium as a killing material induced me years ago to abandon that method. I had the material both in tight-fitting boxes and glass-stoppered bottles, in all cases the cyanide being covered with a stratum of plaster of Paris. As a killer it does admirably, but, according to my experience, it renders the moths so rigid that in setting the wings are very liable to be torn in lifting them into position. This method of killing with cyanide was, indeed, condemned years ago in England owing to this very cause.

GEO. NORMAN.

ZOOLOGICAL MUSEUM, CAMBRIDGE, U. S., DEC. 20.

DEAR SIR,—

I have commenced to study and arrange the Coleoptera in the Museum, and hope to get help on all sides, and shall be particularly glad to see specimens in the less studied groups. At present I have finished the N. American Phytophaga, and hope to work at the Staphylinidæ ere long. I also want to see all the Dytiscidæ that I can, as it is only by a long series that much can be done. I shall be glad to hear from any one interested in exotic insects, also. Yours truly,

G. R. CROTCH.

LARVA OF *P. BREVICAUDA*.

We extract the following from a letter recently received from Mr. Edwards :—Miss Peart has drawn the larva of *brevicauda*. It differs from *asterias* larva in that the black transverse bands are broken, and no yellow spots are between them; the lowest black spot is triangular, and so to each band. It is more like *zolicaon*, although that has yellow spots. The point is that it is not *asterias*.

W. H. EDWARDS, Coalburgh, W. Va., 18th Nov., 1873.

BOOK NOTICES.

- Hackberry Butterflies. Descriptions of the early stages of *Apatura Lycaon*, *Fabr.* and *Apatura Herse*, *Fabr.*, with remarks on their synonymy, from the Trans. St. Louis Acad. Science. 8 vo., pp. 14, with four illustrations by Chas. V. Riley, M. A., Ph. D., St. Louis.
- On Platysyllidæ, a new family of Coleoptera, from the Proceedings of the Zoological Society of London, 8 vo., pp. 6, with one plate, by J. L. Le Conte, M. D.
- Seltame Geschichte eines Tagfalters, von Samuel H. Scudder.
- Proceedings of the Boston Society of Natural History, vol. xv, parts 3 and 4, Dec., '72 to April, '73.
- Nature, to December 11th.
- Science Gossip, December.
- American Naturalist, December, 1873, January, 1874.
- Canada Farmer, December 15 and 30.
- Prairie Farmer to Dec. 27.
- The Horticulturist, Nov. and Dec..
- Rural New Yorker to Jan., '73.
- American Agriculturist, Jan.
- Maine Farmer to Dec. 27.

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